



PE-Series Amplifier

Operating Manual



## Ashly Audio Inc.

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This manual uses a *Perpetual Table Of Contents*. Each page has a copy of the manual's contents in a gray box just like this one. The section you are in will always be bold with the other sections "grayed out." The feature allows you to jump directly to another section without having to return to a Table Of Contents page.

## Important Safety Instructions

### Consignes de sécurité à lire attentivement

This power amplifier can produce dangerous output voltage, power and sound pressure levels. In order to minimize the risk of injury, damage, or hearing loss, please read the entire owner's manual.

Cet amplificateur de puissance peut produire un voltage et une pression acoustique qui pourrait être dangereuse ou pourrait même causer des problèmes ou perte d'acuité auditive. Consultez le manuel d'instruction et observez les consignes.



*The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the device.*

*Le symbole de la foudre dans un triangle équilatéral symbolisant la foudre est prévu pour sensibiliser l'utilisateur à la présence de tension de voltage non isolée à l'intérieur de l'appareil. Elle pourrait constituer un danger de risque de décharge électrique pour les utilisateurs. Le point d'exclamation dans le triangle équilatéral alerte l'utilisateur de la présence de consignes qu'il doit d'abord consulter avant d'utiliser l'appareil.*

1. Read these instructions.
  2. Keep these instructions.
  3. Heed all warnings.
  4. Follow all instructions.
  5. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
  6. Do not use this apparatus near water.
  7. Clean only with dry cloth.
  8. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
  9. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
  10. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
  11. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
  12. Only use attachments/accessories specified by the manufacturer.
  13. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
  14. Unplug this apparatus during lightning storms or when unused for long periods of time.
  15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
1. Lisez ces instructions.
  2. Conservez ces instructions.
  3. Observez les avertissements.
  4. Suivez ces instructions.
  5. Pour réduire le risque de feu ou la décharge électrique, ne pas exposer cet appareil pour pleuvoir ou l'humidité.
  6. Ne pas utiliser l'appareil près de l'eau.
  7. Le nettoyer à l'aide d'un tissu sec.
  8. Ne pas bloquer les ouvertures de ventilation, installer selon les consignes du fabricant.
  9. Eloigner des sources de chaleur tel: radiateurs, fourneaux ou autres appareils qui produisent de la chaleur.
  10. Ne pas modifier ou amputer le système de la mise à terre. Une prise avec mise à terre comprend deux lames dont une plus large ainsi qu'une mise à terre: ne pas la couper ou la modifier. Si la prise murale n'accepte pas la fiche, consulter un électricien pour qu'il remplace la prise défectueuse.
  11. Protéger le cordon de secteur contre tous bris ou pincement qui pourraient l'endommager, soit à la fiche murale ou à l'appareil.
  12. N'employer que les accessoires recommandés par le fabricant.
  13. N'utiliser qu'avec les systèmes de fixation, chariots, trépied ou autres, approuvés par le fabricant ou vendus avec l'appareil.
  14. Débrancher l'appareil lors des orages électriques ou si inutilisé pendant une longue période de temps.
  15. Un entretien effectué par un centre de service accrédité est exigé si l'appareil a été endommagé de quelque façon: si il a été exposé à la pluie, l'humidité ou s'il ne fonctionne pas normalement ou qu'il a été échappé.

## Introduction

Congratulations on your purchase of an Ashly PE-Series (Protea Enabled) amplifier. The PE-Series is made up of high-power, high-efficiency, lightweight amplifiers incorporating the latest in power and control technologies. We are confident that you will be pleased with the high performance, superb sound quality, reliability, remote control and more.

### About Ashly

Ashly Audio was founded in 1974 by a group of recording engineers, concert sound professionals, and electronics designers. The first products were elaborate custom consoles for friends and associates, but business quickly spread to new clients and the business grew. The philosophy we established from the very beginning holds true today: to offer only the highest quality audio tools at an affordable cost to the professional user – ensuring reliability and long life. More than thirty years later, Ashly remains committed to these principles.

Ashly's exclusive Five Year, Worry- Free Warranty remains one of the most liberal policies available on any commercial- grade product. The warranty covers every product with the Ashly brand name, and is offered at no extra cost to you, our customer.

### FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

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## The PE Series

PE-Series (Protea Enabled) amplifiers are high-power, high-efficiency, lightweight amplifiers incorporating the latest amplifier technologies. Each amplifier can be controlled and monitored through the Ethernet port using Protea<sup>NE</sup> Software™ included on the CD that came with the amplifier (visit Ashly.com to check for software updates). Protea<sup>NE</sup> gives users access to many features, including: input attenuation, channel mute, channel polarity, input level, output voltage, output current, clipping, temperature, and monitoring for power on/off.

The series provides a wide power range of 400 to 1900 watts per channel at 4 ohms (20Hz-20kHz, 0.05% THD). All models will drive 2, 4 or 8 ohm loads. Each models is 2RU, weighs 20 pounds and utilizes a state-of-the-art, efficient, high speed switched mode power supply. DC voltage control of the input level and remote power on/off are among the many standard features.

PE-Series Power Ratings				
	Stereo		Mono Bridged	Parallel-Mono
Model	8Ω	4Ω	8Ω	2Ω
3800	1,100W	1,900W	3,800W	3,800W
3000	9,00W	1,500W	3,000W	3,000W
2400	7,00W	1,200W	2,400W	2,400W
1800	5,00W	900W	1,800W	1,800W
1200	3,00W	600W	1,200W	1,300W
800	200W	400W	800W	800W

Input connections are via XLR/TRS Neutrik Combo, and 6-pin Euroblock connectors. XLR male connectors are also provided for looping to additional amplifiers.

Output connectors are locking Neutrik Speakon on all models (models 800 & 1200 also have screw terminal strips with safety covers). Switches on the rear panel include: selectable High Pass Filters, Clip Limiter, Ground Lift, Gain and Operation Mode.

### Protection

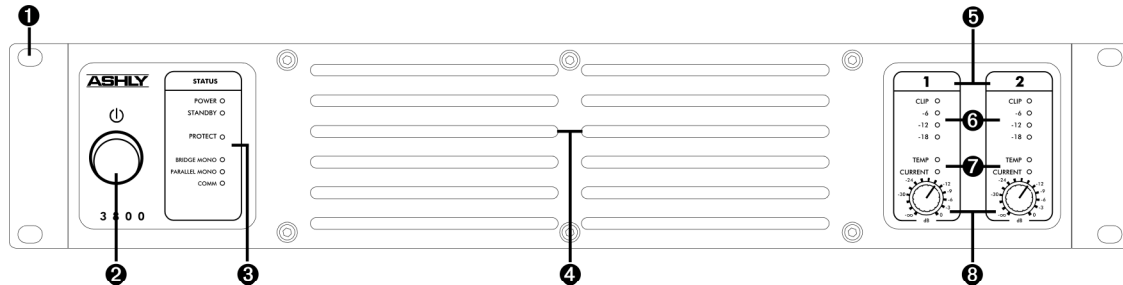
PE-Series Amplifiers come standard with several protection circuits:

- ✦ **Clip Limiter** – On overdrive the clip detection triggers the Attack-Release Circuit delivering control voltage for gain reduction.
- ✦ **SOA Protection** - If the power transistors leave their Safe Operation Area, the SOA-protection switches back the current rail of the respective channel.
- ✦ **DC Protection** - Each output is monitored for DC voltage. If thresholds are exceeded, the corresponding channel will be muted. Minor DC occurrences (once resolved) will return the amplifier to normal. If the DC condition is severe the amplifier will enter standby.
- ✦ **DC Servo** - PE-Series has a DC Servo to prevent DC Offset at the output.
- ✦ **Over Current Protection** - Is controlled in the output stage.
- ✦ **Thermal Protection** - When the internal temperature is below 40°C the fan runs at its slowest speed. Above 40°C the speed is increased until it reaches its maximum value. If the temperature exceeds 85°C, the input on that channel is reduced. If the temperature exceeds 100°C, the power supply is switched off.
- ✦ **Mains Protections** – protection within the power supply includes: Inrush Current Limitation, Mains Over Voltage Detection, Mains Failure Detection, and Fuse Protection

## Physical Description

Each model in the PE-Series is 2RU, and weighs 20 pounds. They all share the same overall physical design. The model number is indicated in the lower left corner of the front panel

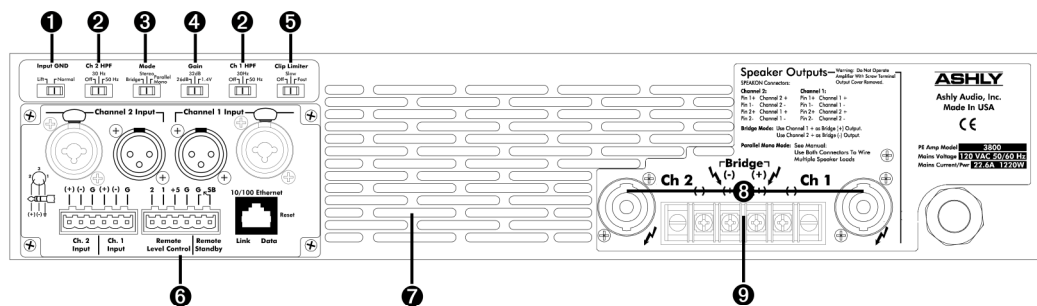
### Amplifier Front Panel



1. **Mounting Holes** – For rack mounting.
2. **Power Switch** – Switches the unit on or off
3. **Status LEDs** – Indicate status of: Power, Standby, Protect, Operating Mode and Comm link
4. **Air Inflow Vents** – Cool air enters here
5. **Channel Controls** – Channel control area
6. **Signal LEDs** – The lowest LED will begin to light when the output voltage reaches approximately 4 volts. When clipping occurs the Clip LEDs will begin to flash. If clipping

7. **Fault Indicators** – These LEDs indicate if the amplifier has entered a temperature or current fault mode and will remain lit until the fault is corrected.
8. **Channel Attenuators** – For adjustment of the input signal.

### Amplifier Rear Panel



1. **Input Ground Lift** – This switch isolates or connects the signal ground to the power ground
2. **High Pass Filter** (both channels) – This switch sets the High Pass Filter for each channel to 30Hz, 50Hz or Off. Depending on your system set-up, there may be an audible "pop" when engaging the HPF. It is recommended that you operate these switches with the amplifier off.
3. **Operating Mode** – This switch selects the amplifier's operating mode (Bridge, Stereo, or Parallel). NEVER OPERATE THIS SWITCH WITH THE AMPLIFIER ON.
4. **Input Gain** – This switch sets the amplifier gain to 26dB, 32dB, or 1.4V sensitivity.

5. **Clip Limiter** – This switch sets the clip limiting circuitry to Off, Slow or Fast.
6. **Input Module** – Details on the next page
7. **Cooling Air Outflow Vents** – These vents must remain open and unobstructed at all times
8. **Speakon™ Output Connectors** – These connectors provide a convenient and fast connection to your speakers.
9. **Screw Terminal Output Connectors** – Only on models 800 & 1200, these traditional connectors can be used in tandem with (impedance dependent) or in lieu of the Speakon output connectors

**WARNING:** Do not remove the mains connector ground. It is illegal and dangerous.

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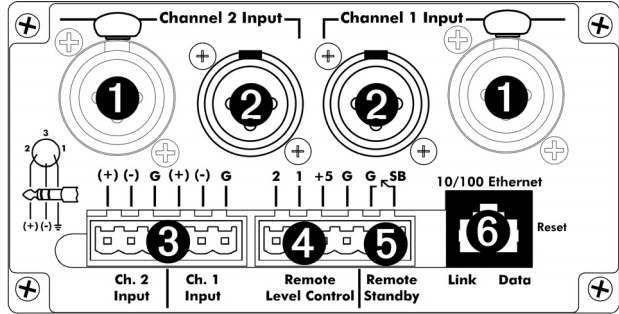
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Terminals marked with are HAZARDOUS LIVE. External wiring to these terminals/connectors requires installation by trained personnel, or pre-manufactured cables

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## Input Module

The PE-Series has been designed with flexibility in mind. The input section illustrated at right has been engineered in modular form. All amplifiers ship with the standard input (shown) unless the Optional 32 bit/96kHz Protea<sup>NE</sup> DSP card is specified. This optional module features both analog and digital (AES/EBU) inputs, and two



additional processed output channels to drive additional amplifier channels.

Documentation for this module is provided in a separate document. If there is an input feature or function you'd like to see developed for the PE-Series, please contact Ashly.

1. **XLR/TRS Combo Balanced Inputs** – These connectors accept either a Male XLR or 1/4" TRS connector
2. **Channel Input Turnarounds** – These connectors provide signal to additional amplifiers via male XLR connectors.
3. **Euroblock Connector Channel Inputs** – These connectors are in parallel with the Combo Inputs and allow for signal connection using Euroblocks.
4. **Remote Level Control Connector** – This connector facilitates hard-wired remote attenuation control.\*
5. **Remote Standby Connector** – This connector facilitates hard-wired remote on/off functionality.\*
6. **Ethernet Connector & Indicators** – This CAT-5 Ethernet connector interfaces with a Protea NE network, or computer if available. The indicators show network link and data activity.

\*See the wiring diagram on page 12 for more information.

## Installation

PE-Series amplifiers are designed for use in both fixed and mobile sound systems. Each amplifier is shipped (unless otherwise specified) with the following factory settings:

Front panel:	Rear panel:
On/Off Switch = Off	Input Ground Lift = Grounded
Attenuators = ∞	High Pass Filters (both Ch.) = Off
	Mode Selector = Stereo
	Clip Limiter = Off
	Gain Selector = 32 dB

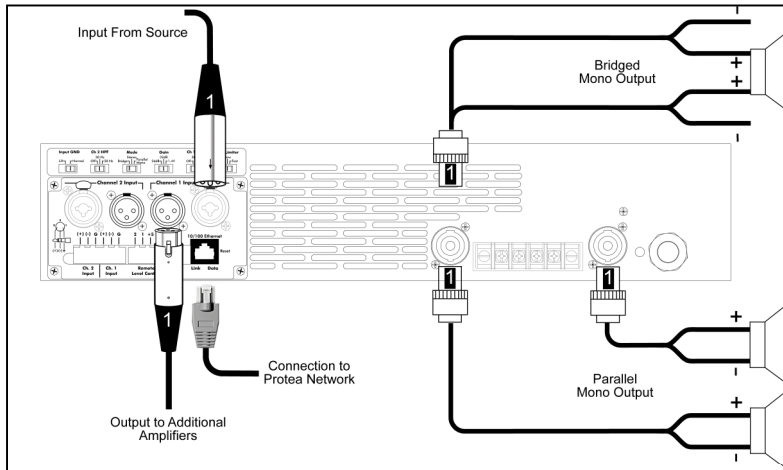
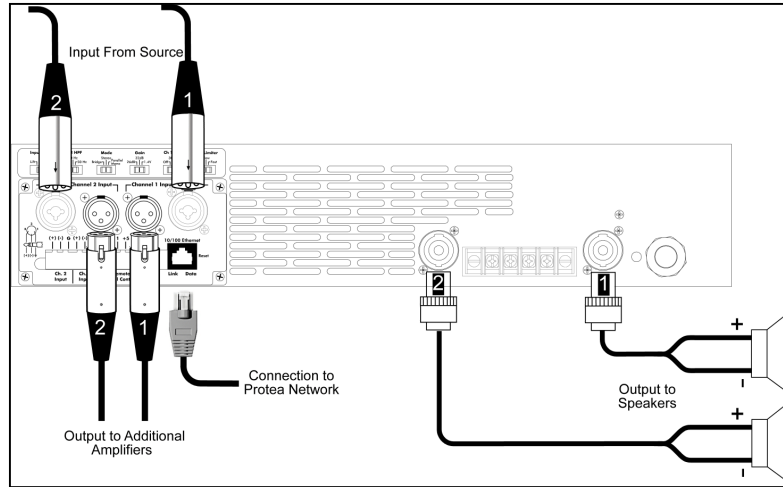
Before connecting to mains power, make sure that the switches are set to the configuration needed for your particular application. Always switch the amplifier off before making any changes to the settings. Failure to do so could result in damage to the unit or other components in your system. **CAUTION:** When mounting or connecting the amplifier, always disconnect it from the mains. Use four screws and washers when mounting the amplifier to the front rack rails. Rear support is also recommended, especially for mobile or touring use. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

## Requirements

PE-series amplifiers have specific physical, electrical and signal requirements for proper operation. These requirements will vary depending on your specific application, setup, and the settings on the amplifier. When setting up and testing your system, please take special care to double check all connections and settings. Please refer to the specifications section of this manual for specific input, output and other figures.

### Typical Applications

The most common use of a PE-Series amplifier is a 2-channel source driving 2 speaker channels. In this illustration, the PE-Series amplifier is receiving a signal and then ‘returns’ it to a second amplifier using the provided connectors. The amplifier is in STEREO mode.

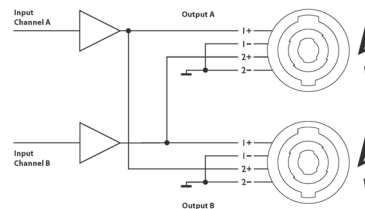
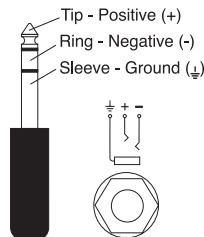
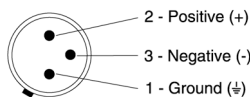
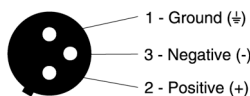


Because of their efficient and high-power design, PE-Series amplifiers are well suited to single channel output to mono speaker load such as a subwoofer. This illustration shows both PARALLEL and BRIDGED output connections using a single input signal.

Terminals marked with ⚡ are HAZARDOUS LIVE. External wiring to these terminals/connectors requires installation by trained personnel, or pre-manufactured cables

### Connectors & Polarity

PE-Series amplifiers utilize several different professional audio connectors. The Euroblock (and Screw-Terminals on models 800 & 1200) connectors are clearly marked on the amplifier’s rear panel and are straightforward. The connection polarity for the other three types of connectors (XLR, TRS, and Speakon) are less obvious. The diagrams below show how each connector should be wired for proper operation. Be sure to read the Operation section of this manual for important information on the three operating modes.



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## Operation

The amplifier's On/Off Switch is a rocker-type switch located on the left side of the front panel. Turning on the amplifier initiates start-up by activating the inrush current limiter. During power up, the Clip and Signal LEDs from both channels will light up in red for a few seconds.

When using the remote On/Off function, the main On/Off switch must remain in the On position. See page 11 for more information on remote On/Off connections.

**NOTE:** The power switch does NOT isolate the appliance from mains. Make sure the mains power socket or an alternative disconnect device is near by and easily accessible. When the product is connected to mains, the line-filter and the input of the fuse are energized.

### 2 Channel (Stereo) Mode

In this mode, the amplifier's two channels operate fully independent of each other. Each signal enters the unit and is amplified separately.

### Parallel-Mono Mode

In this mode, a single input signal (connected to channel 1) is connected to the two output channels. The output terminals of the two channels are configured in parallel using an internal relay. The (single) load is connected either to the output of channel 1 or to that of channel 2 (as if in stereo). While the total output of the amplifier remains the same and the output voltage level is also the same as in stereo operation, the minimum impedance that can be connected is reduced by half because the current capability is doubled. Only the Channel 1 attenuator is active. The Channel 2 attenuator should be turned down to zero. This mode is useful when identical loudspeakers are to be operated with the same power.

**IMPORTANT:** When connecting speaker cabinets in parallel, always use all the contacts in both SPEAKON connectors. If not, this can cause permanent damage to the connectors and considerably reduce performance.

### Bridged Mono Mode

In this mode, a single input (connected to channel 1) is connected to the two output channels that have been 'Bridged' together. Each output channel processes the signal, but the polarity of channel 2 is reversed. The (single) load is connected between the two positive channel outputs using a suitably connected SPEAKON connector. While the total output of the amplifier remains the same, both the available output voltage and the minimum impedance that can be connected are doubled, as compared with stereo operation. Only Channel 1 is active. A signal feeding Channel 2 will have no effect on the output.

**WARNING!** In Mono-Bridge mode RMS output voltages as high as 230 V. Wiring to the speaker loads must conform to NEC Class 3 safety standards or its equivalent. All customer specific cables should only be manufactured by qualified personnel.

**WARNING!** Terminals marked with  are HAZARDOUS LIVE. External wiring to these terminals/connectors requires installation by trained personnel, or pre-manufactured cables.



## Troubleshooting

Situation	Indication	Action
No Sound	Signal LED not lit Clip LEDs not lit	Check AC plug. Confirm that AC outlet works by plugging in another device.
	Output Current LEDs are lit Signal LED not lit	Make sure the signal source is operating and try another cable. Check position of Volume Pots.
	Output Current LEDs are lit Signal LEDs responding to signal level	Check the speaker wiring for breaks. Try another speaker and cable.
	Signal LEDs show red (Protect Mode)	Overheating will cause protective muting. Check for proper ventilation. If the fan isn't running the amplifier requires servicing.
No Channel Separation	No Channel Separation	Check the mode indicators on the front panel and make sure the mode selector on the rear panel is in the stereo-position. Make sure other equipment in the signal path such as mixers and preamps are set for stereo, not mono
Distorted Sound	Power LED is lit	A faulty speaker or a loose connection could cause this. Check the wiring and try another speaker.
	Signal LEDs responding to signal level	The signal source might be clipping. Keep the volume pots at least halfway up so that the source does not have to be overdriven.
	Clip LEDs not lit	Keep the volume pots at least halfway up and try changing input sensitivity from 1,4 V to 32 dB or 26 dB with the gain selector on the rear.
Hiss	Hiss	Unplug the amplifier input to confirm that the hiss is coming from the source or from a device upstream. Erratic or popping noises indicate an electronic fault in the offending unit. To keep the noise floor low, operate the primary signal source at full level, without clipping. Avoid boosting the signal further between the source and the amplifier.
Squeals and Feedback	Squeals and Feedback	Microphone feedback should be eliminated with mixer controls. If noise continues to build up with no microphone gain, there is a serious fault in the signal processors or cables. Working in succession from the signal source towards the amplifier and check each device in the signal path by reducing its gain or by unplugging it.
Protea Communications Failure	Comm LED lit	Check connection between computer and any routers or switched in the network. Reboot computer. If issue is not resolved, consider replacing CAT-5 Cables
	Comm LED not lit	Check connection between amplifier and network. Reboot computer. If issue is not resolved, consider replacing CAT-5 Cables

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## Spec Table

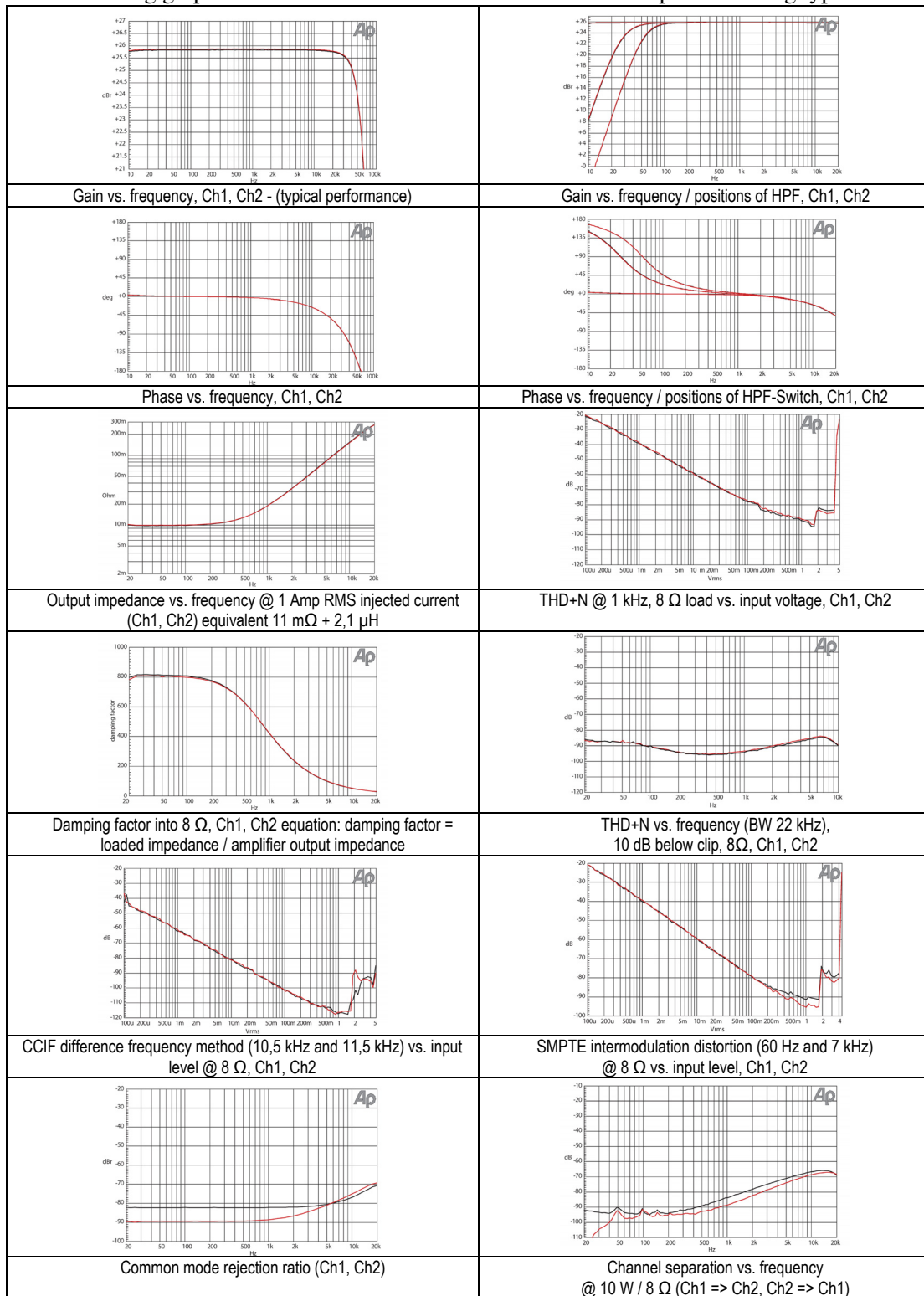
	PE-800	PE-1200	PE-1800	PE-2400	PE-3000	PE-3800	
<b>Power Output</b>							
Stereo Mode, both channels driven							
8 ohms, 20 Hz - 20 kHz, 1% THD	200 W	300 W	500 W	700 W	900 W	1,100 W	
4 ohms, 20 Hz - 20 kHz, 1% THD	400 W	600 W	900 W	1,200 W	1,500 W	1,900 W	
Bridged Mono Mode							
8 ohms, 20 Hz - 20 kHz, 1% THD	800 W	1,200 W	1,800 W	2,400 W	3,000 W	3,800 W	
Parallel Mono Mode							
2 ohms, 20 Hz - 20 kHz, 1% THD	800 W	1,300 W	1,800 W	2,400 W	3,000 W	3,800 W	
Signal to Noise (20 Hz-20 kHz, unweighted):	>98 dB	>105 dB	>108 dB	>110 dB	>111 dB	>112 dB	
Voltage Gain:	26 dB, 32 dB or 1.5 V sensitivity (selectable)						
Output Circuitry:	Bipolar, Class AB	Bipolar, Class AB	Bipolar, Class H	Bipolar, Class H	Bipolar, Class H	Bipolar, Class H	
Power Requirements (1/8 Power Pink Noise @ 4 Ohm):	420W	640W	611W	790W	1010W	1220W	
<b>All Models</b>							
Distortion (SMPTE, typical) - 8 ohm load, 10 dB below rated power							<.01%
Distortion (THD+N, typical) - 8 ohm load, 10 dB below rated power, 20 Hz - 10 kHz							<.01%
Frequency Response	20 Hz - 20 kHz, +/- 0.15 dB						
Damping Factor - 8 ohm load, < 1 kHz	> 400						
Input Impedance	20 kOhm, balanced						
Maximum Input Level:	+21 dBu						
Input Clipping							
Cooling	temperature dependent speed-controlled axial fan						
Control Network:	onboard, compatible with standard 100 MB Ethernet hardware						
Front Panel Indicators	Per channel: Clip, -6 dB, -12 dB, -18 dB, Temp, Output current.						
	Overall: power, standby, protect, bridged mono, parallel mono, communications						
Attenuators:	Per channel: front panel, software, offset and remote						
Input Connectors, each channel	XLR female/TRS, Euroblock, XLR male (looping)						
Output connectors, each channel	Speakon, screw terminals (Model 800 and 1200 only)						
Amplifier Protection	inrush current limitation, temperature monitoring heat-sinks, output DC protection, power transistor SOA protection, output over-current protection, mains fuses protection						
Load Protection	Adjustable clip limiter						
Power Cable Connector	15A Edison	20Amp			30A Twistlock		
Dimensions	19"W x 3.5"H x 15.5"D (483mmW x 88.9mmH x 394mmD)						
Weight	22 lbs. (9.98kg)		23 lbs. (10.43kg)		24 lbs. (10.89kg)		

Optional Protea <sup>NE</sup> /DSP Input Card	
Latency	Analog - 1.512 ms at 48KHz sampling. Digital - 0.784 ms at 96KHz sampling.
A/D, D/A Converters:	24-bit
DSP	32-bit, floating-point
Digital Input Type	AES3, 16-24 bit, 44.1 to 96 kHz.
Signal Flow Architecture	"Click and hot plug" flexible architecture, non-compiling
Available Processing Blocks	
Equalization	Parametric, Notch, Graphic, Shelving, HPF/LPF, All pass
Signal Delay	Up to 967msec any input/output
HPF/LPF	Up to 8th order (48 dB/octave)
Compressor/Limiter, Gate, Meter	
Signal Generator	Pink noise, White Noise, Sine Wave
Level Control	With or without VCA-type subgrouping

*All Specifications Subject to Change or Improvement Without Notice.*

## Measurements

The following graphs are actual measurements from PE-Series amplifiers during typical use.

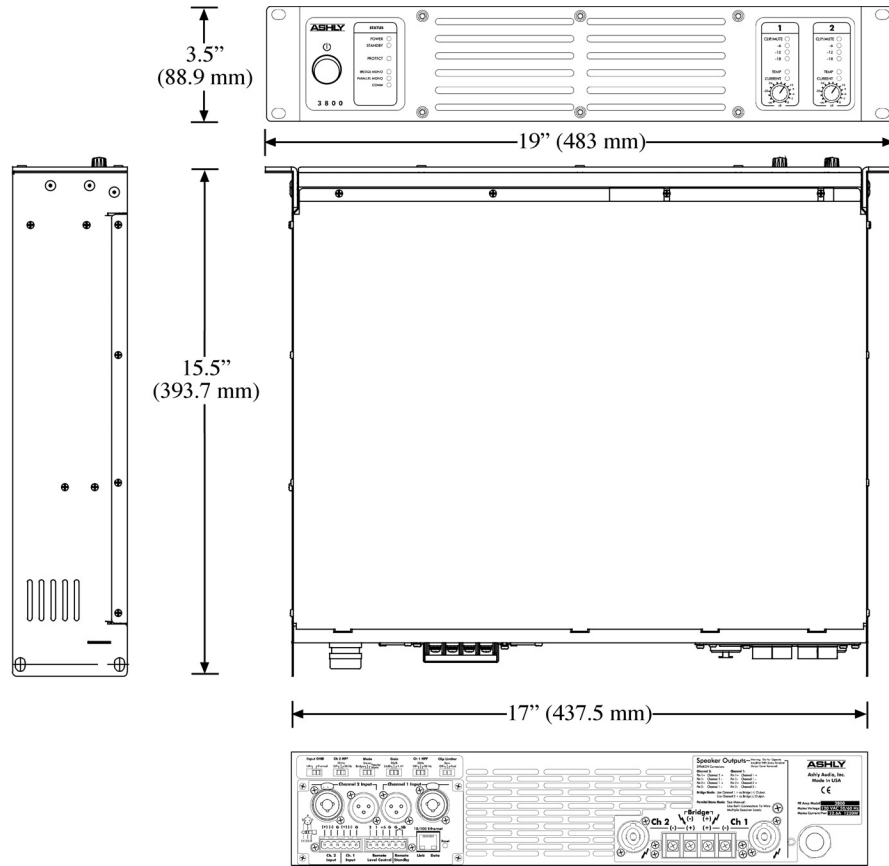


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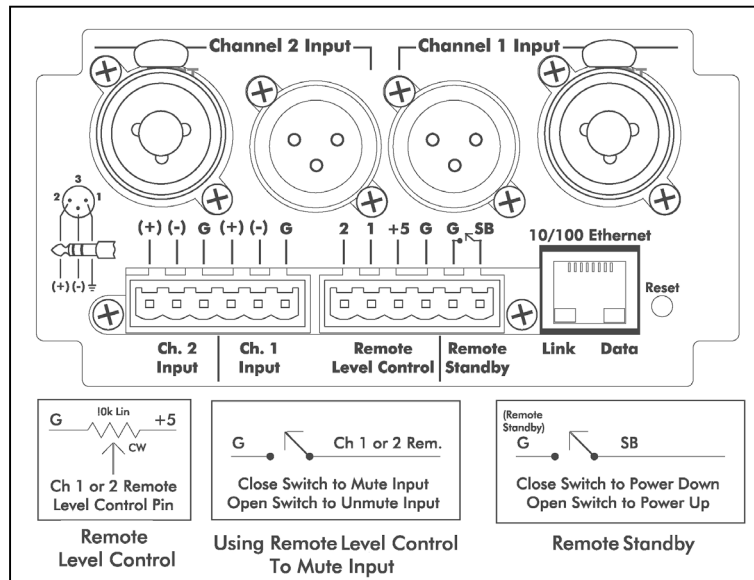
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## Amplifier Dimensions

All PE Series amplifiers share the same dimensional measurements:



## Remote Level & Power Connections



## Limited Warranty

Warranty service for this unit will be provided by ASHLY AUDIO, INC. in accordance with the following warranty statement.

ASHLY AUDIO, INC. warrants to the owner of this product that this product and the components thereof, will be free from defects in workmanship and materials for a period of FIVE years from the date of purchase. ASHLY AUDIO INC. (ASHLY AUDIO) will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

**EXCLUSIONS:** This warranty does not apply in the event of misuse, neglect or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed. ASHLY AUDIO reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

Any implied warranties which may arise under the operation of State law shall be effective only for FIVE years from the date of purchase of the product. Ashly Audio shall be liable only to correct defects in the product itself, and not for any damage or injury which may result from or be incidental to or a consequence of such defect. Some states do not allow either limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

### OBTAINING WARRANTY SERVICE:

For warranty service in the United States, please follow this procedure:

- 1.) Return the product to Ashly, freight prepaid, with a written statement describing the defect and application the product is used in. Ashly Audio will examine the product and perform any necessary service, including replacement of defective parts, at no further cost to you.
- 2.) Ship your product to:  
Ashly Audio Inc.  
Attn: Service Department  
847 Holt Road  
Webster, NY 14580-9103

For units purchased outside The United States of America, service will be provided by an authorized distributor of ASHLY AUDIO, INC.

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